Amendment to the Claims

This listing of claims will replace all prior versions and listings of claims in the above-referenced application.

Listing of Claims:

1. (Original) An elongated current limiting composite, comprising:

at least one oxide superconducting member; and

at least one second electrically conductive member substantially surrounding the at least one oxide superconducting member,

wherein the composite exhibits an electric field in the range of about 0.05-0.5 V/cm during a fault current limiting event, wherein a fault current limiting event comprises passing about 3-10 times an operating current through the composite, the operating current selected to be less than or about equal to the critical current of the oxide superconductor and greater than or about equal to one-half the critical current of the oxide superconductor at a selected operating temperature less than the critical temperature of the at least one oxide superconducting member.

2. (Original) The composite of claim 1, wherein the second electrically conductive member comprises a silver-containing matrix.

3. (Original) The composite of claim 2, wherein the silver-containing matrix further includes at least one element selected from the group consisting of gallium, tin, cadmium, zinc, indium, and antimony.

4. (Original) The composite of claim 2, wherein the second electrically conductive member further comprises at least one bonding agent thermally connected to the matrix.

5. (Original) The composite of claim 4, wherein the second electrically conductive member further comprises at least one thermal stabilizing element thermally connected to the at least one bonding agent.

6. (Original) The composite of claim 5, wherein the at least one thermal stabilizing element comprises stainless steel.

7. (Original) The composite of claim 6, wherein the bonding agent comprises an adhesive or solder.

8. (Original) The composite of claim 5, wherein the at least one thermal stabilizing element comprises a copper alloy containing at least 3 weight % titanium and 0-5 weight % silicon.

9. (Original) The composite of claim 8, wherein the bonding agent comprises an adhesive or solder.

10. (Original) The composite of claim 5, wherein the composite is in the form of a wire.

11. (Original) The composite of claim 1, wherein the heat capacity of the composite is sufficient to prevent the composite temperature from rising above the critical temperature of the at least one superconducting oxide member during a fault event.

12. (Original) The composite of claim 11, wherein $C_p \times \text{density} \times [\mathrm{T_c} - \mathrm{T_{op}}] \times \frac{\rho_{\mathrm{el}}}{\mathrm{V}^2} > \mathrm{t}$

where C_p is the average specific heat for the composite, density is the average density for the composite, T_c is the critical temperature of the superconducting member, T_{op} is the operating temperature, ρ_{el} is the current dependent average resistivity of the composite, averaged over the duration of a fault event of duration t, V is the voltage gradient along the composite, and t is about 50 msec.

13. (Original) The composite of claim 12, wherein t is about 150 msec.

14. (Original) The composite of claim 12, wherein t is about 250 msec.

15. (Original) The composite of claim 12, wherein t is about 500 msec.

16. (Original) The composite of claim 12, wherein t is about 1000 msec.

17. (Original) The composite of claim 12, wherein t is about 2000 msec.

18. (Original) The composite of claim 1, wherein sufficient heat can be dissipated from the composite while carrying the operating current after a fault event to allow the composite to cool to the operating temperature.

19. (Original) The composite of claim 18, wherein $J_{op}^2 \times \rho_{el}^* < h \times (T_c - T_{op}) \times \alpha$

where J_{op} is the operating current density, h is the effective heat transfer coefficient of the composite, T_c is the critical temperature of the superconducting member, T_{op} is the operating temperature, α is the form factor of the composite, and ρ_{el}^* is the current dependent average resistivity of the composite at the end of a fault event of 50 msec duration.

20. (Original) The composite of claim 19, wherein ρ_{el}^* is the current dependent average resistivity of the composite at the end of a fault event of 150 msec duration.

21. (Original) The composite of claim 19, wherein ρ_{el}^* is the current dependent average resistivity of the composite at the end of a fault event of 250 msec duration.

22. (Original) The composite of claim 19, wherein ρ_{el}^* is the current dependent average resistivity of the composite at the end of a fault event of 500 msec duration.

23. (Original) The composite of claim 19, wherein ρ_{el}^* is the current dependent average resistivity of the composite at the end of a fault event of 1000 msec duration.

24. (Original) The composite of claim 19, wherein ρ_{el}^* is the current dependent average resistivity of the composite at the end of a fault event of 2000 msec duration.

25. (Original) The composite of claim 1, wherein the heat capacity of the composite is sufficient to prevent the composite temperature from rising above the critical temperature of the at least one superconducting oxide member during a fault event and wherein sufficient heat can be dissipated from the composite while carrying the operating current after a fault event to allow the composite to cool to the operating temperature.

26. (Original) The composite of claim 25, wherein

$$C_p \times \text{density} \times [T_c - T_{op}] \times \frac{\rho_{el}}{V^2} > t$$

and wherein

$$J_{op}^2 \times \rho_{el}^* < h \times (T_c - T_{op}) \times \alpha$$

where C_p is the average specific heat for the composite, density is the average density for the composite, T_c is the critical temperature of the superconducting member, T_{op} is the operating temperature, ρ_{el} is the current dependent average resistivity of the composite, averaged over the duration of a fault event of duration t, ρ_{el}^* is the current dependent average resistivity of the composite at the end of a fault event of duration t, V is the voltage gradient along the composite, J_{op} is the operating current density, h is the effective heat transfer coefficient of the composite, α is the form factor of the composite, and t is about 50 msec.

27. (Original) The composite of claim 26, wherein t is about 150 msec.

28. (Original) The composite of claim 26, wherein t is about 250 msec.

29. (Original) The composite of claim 26, wherein t is about 500 msec.

30. (Original) The composite of claim 26, wherein t is about 1000 msec.

31. (Original) The composite of claim 26, wherein t is about 2000 msec.

32.-49. (Cancelled)